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09/237,229 01/26/99 KIM

K SEC. 0584

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| EXAMINER |
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IM22/0521

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| MACARTHUR, S | |
| ART UNIT | PAPER NUMBER |

15

1763

DATE MAILED:

05/21/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/237,229

Applicant(s)

KIM ET AL.

Examiner

Sylvia R MacArthur

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9 and 14.
- 18) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 8, 26-29, 31, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Maydan (USP 5,292,393).

Maydan (USP 5,292,393) teaches a multichamber integrated process system. The system includes a load lock, an external (first cassette stage) cassette elevator 24, and an internal load lock wafer elevator (second cassette stage). A plurality of vacuum process chambers (16, 18, 20, and 22) is connected to the load lock chamber. A robot is mounted within the load lock

The process chambers 16-22 and the associated main frame walls 13-13 also have communicating slits 36-36 which are similar or identical to the load lock entrance slit (gate).

The elevator 24 is adapted by indexing system 40 for reciprocal vertical indexing movement 31. Robotic wafer transfer system 80 is mounted within the load lock chamber 12 for transferring the wafers 15-15 between the external elevator 24 and the internal elevator 50. Blade 106 can operate as a vacuum pick, in which case the wafers are picked up at the end of the blade from cassettes 26 and 28 or deposited into the cassettes, in the external atmospheric pressure ambient. Pocket 108 can be used to hold wafers during transfer between the internal load lock elevator 50. In short, the blade can pick up wafers at atmospheric pressure or in a vacuum.

The robot 80 is further disclosed in col. 5 lines 34-50. The operation of respective stepper motors 150 and 152 is controlled by the controller/computer 70.

In Figures 1 and 3, blade 106 had holes 110-110 adjacent the outer end that are connected to a vacuum pump (not shown) by a vacuum line 112.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2, 3, 5, 6, 9, 11-25, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yonemitsu et al (USP 5,788,447) in view of Maydan.

Yonemitsu discloses a substrate processing apparatus 1 comprising a substrate transfer chamber, a plurality of substrate processing chambers 70 disposed on a first side wall 53 of the substrate transfer chamber 50, and stacked in the vertical direction, a plurality of gate valves 93, each disposed between each of the processing chambers and the substrate transfer chamber.

The substrate processing apparatus is composed of a processing section 700, a transfer section (transfer path) 500, and a front section 100.

There are a plurality of first valves, located between each of the substrate processing chambers and the substrate transfer chamber, and each of the plurality of first valves (gate valves) is capable of providing hermetic vacuum isolation between the processing chambers and the transfer chamber, when closed. These valves allow the substrates to pass through when opened, according to col. 3, lines 3-14.

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The load lock chamber can be depressurized independent of the substrate transfer chamber. Two load locks are provided one for incoming substrates and the other for outgoing substrates.

The transfer section 500 comprises a transfer module 501, which includes a wafer transfer chamber 50 and a wafer-transfer vacuum robot 60. The front section 100 is composed of a plurality of load-lock modules 300 and an atmospheric pressure section 200. Each load lock module 300 is composed of a wafer accommodating chamber 30, a gate valve 92, and a front door valve. There are disposed cassette shelves 11 for mounting a cassette 10 and a cassette transfer and wafer transfer device 20.

The wafer-transfer vacuum robot 60 is disposed within the wafer transfer chamber 50. The wafer-transfer vacuum robot 60 is an articulated robot and is composed of arms 63, 65, and 67. Each arm is swingable in a corresponding horizontal plane allowing the wafers to be moved in the horizontal direction. The wafer transfer robot 60 can transfer two wafers 5 at one time using the two wafer mounting arms 68, see Figures 5A and 5B.

Cassette shelves 11 are disposed within and attached to the housing 900 and are disposed substantially opposite the wafer transfer chamber 50. A cassette transfer device 21 and wafer transfer device 23 is disposed on bases 25 and 26 and can independently perform parallel displacement. The cassette transfer device 21 has a cassette transfer arm 22 and transfers the cassette 10 which is mounted on a cassette holder 27 attached to end of the cassette transfer arm 22. Note the cassettes are loaded at atmospheric pressure.

Walls 53 and 54 of the wafer transfer chamber 50 are opposed to each other so as to arrange on a substantially straight line the reaction chamber 70, the wafer transfer chamber 50,

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and the wafer accommodating chamber 30, and the wafer transfer chamber 50 has a rectangular shape as viewed in Fig.3.

Fig. 11 illustrates a gate valve located away from the transfer path (90).

The cassette transfer and wafer transfer device 20, not the wafer-transfer robot 60 are disposed within the wafer transfer chamber 50, is used for transferring wafers 5 between the wafer accommodating chamber 30 and the cassettes 10.

Yonemitsu fails to disclose that the transfer path is at atmospheric pressure.

The teachings of Maydan were discussed above.

The motivation to maintain the transfer path at atmospheric pressure is ensure a clean wafer processing environment. The likelihood of cross contamination is greatly reduced when the path is kept at atmospheric pressure.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to maintain the transfer path of Yonemitsu at atmospheric pressure.

5. Claims 1,2, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoyama et al (USP 5,820,679) in view of Maydan.

Yokoyama discloses a fabricating system including a plurality of processing apparatus connected to each other by an inter-apparatus transporter. Figure 1 illustrates the processing chambers installed in multiple layers. Gate valves are formed between each type of chamber (load/unload/process) some are located on a side of the processing chamber away from the transfer path. The gates are selectively opened and closed to allow passage of the wafers.

The teachings of Maydan were discussed above.

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The motivation to maintain the transfer path at atmospheric pressure is ensure a clean wafer processing environment. The likelihood of cross contamination is greatly reduced when the path is kept at atmospheric pressure.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to maintain the transfer path of Yokoyama at atmospheric pressure.

6. Claims 1,2, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono (USP 5,527,390) in view of Maydan.

Ono discloses a treatment system with a treatment apparatus for performing a predetermined treatment for a planar workpiece contained in a carrier. This system comprises transfer paths 408a, 409. Figure 1 illustrates a plurality of upright type heat treatment apparatuses 10,12, 14, and 16, an I/O station 20, and a transfer path 24. The carrier liner 22 travels on the transfer path 24. The I/O station 20 has a carrier transfer unit 26 which transfers one or two carriers CR between an external transfer robot (not shown) and the carrier liner 22.

Fig. 18 illustrates a carrier holding mechanism 418, which has a carrier holding portion 419 consisting of two opposing parts. The carrier holding portion 419 has two carriers CR at a time. The holding mechanism carries the wafers in the vertical position.

The teachings of Maydan were discussed above.

The motivation to maintain the transfer path at atmospheric pressure is ensure a clean wafer processing environment. The likelihood of cross contamination is greatly reduced when the path is kept at atmospheric pressure.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to maintain the transfer path of Ono at atmospheric pressure.

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7. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maydan.

The teachings of Maydan were discussed above.

Maydan fails to teach that the load lock chambers are provided with a vacuum pressure generator, though he does disclose that the load lock chambers are maintained at vacuum conditions.

Vacuum pressure generators such as pumps are art-recognized devices to maintain vacuum conditions in processing and load lock chambers.

Therefore, it would have been obvious at the time of the claimed invention to provide the load lock chambers of Maydan with vacuum pressure generators.

Response to Arguments

8. Applicant's arguments with respect to claims 1-3 and 5-32 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R MacArthur whose telephone number is 703-306-5690.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-3599 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Sylvia R. MacArthur

May 21, 2001



GREGORY MILLS
SUPERVISORY PATENT EXAMINER
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